DOCUMENT RESUME

ED 300 357 SP 030 671

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TITLE Learning Strategies: Teaching Students How To Learn.
PUB DATE 88
NOTE 14p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Behavioral Objectives; *Cognitive Processes; Elementary Secondary Education; *Learning Strategies; Memory; *Study Skills; *Teaching Methods; Transfer of Training

ABSTRACT

A review of research on the subject of how students learn identifies various techniques that have been used successfully in facilitating learning; e.g., memorization, repetition, review. In discussing the differences between active and passive learning, it is pointed out that tactics used by good students include organizational strategies, summarizing, and creating analogies. It is suggested that to improve learning skills, students from their earliest years of schooling should be taught memory aids, highlighting, underlining and summarizing. (JD)

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Learning Strategies:

Teaching Students How to Learn

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"Learning strategies are defined as techniques, principles, or rules that will facilitate the acquisition, manipulation, integration, storage and retrieval of information across situations and settings"

The above definition by Alley and Deshler (1979, p. 13) encompasses a highly neglected area in education - that of the process of teaching our students how to learn. At an early age, students relied on simple rote repetition and rehearsal to learn. Or perhaps better phrased - to memorize. In fact, students did not rely on said tactics, but merely dutifully obeyed teachers who told them to copy spelling words or the multiplication tables several times over. However, this was a beginning - a foundation for learning. The more one repeated something, the better they recalled it. Often understanding was superficial - we learned the "Pledge of Allegiance" not knowing what many terms meant or why we repeated it. We were told to do it and we did it. Often repetition was unnecessary - sometimes certain material was so distinctive that we remembered it fairly easily. Simple exposure to certain things left an indelible imprint on one's mind or memory. The young mind would often soak up, as a sponge, much material sans effort or repetition. If you were a victim of a parochial school education your "forgetting" might be punished via the use of a ruler on your knuckles or outstretched palm.

As the years progressed, many good teachers endeavored to facilitate the educational process through the use of mnenomics - these "memory devices" again aided recall of either esoteric material (e.g. Roy G. BIV - red, orange, yellow, green, blue, indigo, violet) or salient useful information (thirty days hath September, April, June, etc.). Often

acrostics such as EGBDF (Every Good Boy Does Fine) and FACE were utilized in the musical world to help us remember the five lines and four spaces.

A variant of repetition, review, was later found to be effective by some students. Instead of massed practice (writing words and their definitions 100 times) periodic review was found to work just as well - and writer's cramp did not result.

Review is often utilized by teachers surreptitiously. A map of the United States posted on a bulletin board may foster student learning - almost by osmosis. By seeing the map, every day for 180 school days, he/she may recognize at least the configuration of the United States, if not some of the main states. Thus, simple on-going exposure is a form of repetition and often students assimilate much material in this fashion.

As students progress through the curriculum they begin to encounter more complex problems and difficulties. In order to comprehend, a student often needs an example. By providing such an example a teacher facilitates learning .

Often, by paraphrasing, or re-phrasing, teachers are able to better communicate subtle nuances which may not have been understood by students. The example may be useful in terms of the process, or by giving a specific relevant example from a student's own experience.

Active vs. Passive Learning

While some rehearsal strategies involve mindless repetition, other reiterative procedures are more consciously deliberate and involve much effort. Some rehearsal strategies may involve repeating key terms aloud

(shadowing), taking selective verbatim notes or underlining salient points.

Elaboration is a more active process wherein connections are formed between the new material and prior learned material in one's "ideational scaffolding". Often, forming mental images to link material is helpful. Summarizing, creating analogies and self-questioning can be helpful. The self-questioning can be internal or external. Certainly, the internal self-questioning can be accomplished just about anywhere and requires no printed matter. On the other hand, having students write questions in preparation for a quiz or test may force a more active processing program or approach.

Organizational strategies can be either active (outlining) or passive (internally associating and organizing). Many students learn to impose order and structure on materials. They utilize advance organizers, headings, and note highlighted words. Others subdivide large amounts of material into sub-units or clusters and specify super-ordinate, subordinate relationships. For low level materials, breaking long, lengthy lists into subgroups or clusters can be helpful. For long or lengthy assignments, good students set sub-goals and break large topics down into subcomponent parts. Artistically inclined individuals create diagrams and flow charts depicting the hierarchical flow and the various networks involved in a subject.

"Learning" Strategies in Reading

Although reading has been seen as a complex "psycholinguistic guessing game" and is engaged in by almost all students, it has received only passing attention as an active means of learning. Good readers, of course, may have already learned, intuitively, the skills to make reading a meaningful learner experience. Of course, success builds upon success, and the more one reads, the more successful one becomes. Good readers engage in comprehension monitoring, initiating it at the beginning of an assignment and continuing it until the culmination of reading (Brown, 1980).

Early learning strategies in reading include the Who, What, When, Where, Why approach. This focuses on factual knowledge. SQ3R (Robinson, 1941) is probably the most famous methodology for teaching reading comprehension. Students must survey, question, then read, recite and review.

Dansereau and his associates (1979) have ascertained that by training students to use specific reading strategies involving paraphrasing, constructing idea networks and defining the main ideas and forming relationships between those main ideas, facilitated performance significantly on both short answer and multiple choice tests.

Gordon and Braun (1985) succinctly developed a series of cognitive structural questions to assist students in improving their reading comprehension:

1. Setting: Where and when did the story take place? Who was in it?
2. Main Goal: What is the main goal?
3. Starter event: What started the chain of events in the story (first episode)?
4. Inner response: What does the character think, feel or want?
5. Action: What does the main character do?
6. Reactions: What are the reactions of the characters?
7. Outcome: What happened as a result of the main character's action? or reaction? (p. 70)

Underlining, too, is an oft engaged in process by students to highlight or emphasize. Good students seem to be able to discriminate between what is important and what is not. Highlighting, through the use of magic markers and those colored instruments is a similar procedure. Good students highlight the critical, salient material that they suspect will appear on a test. They have intuitively learned what to expect in terms of questions from certain instructors and are highly sensitive to terms, concepts and ideas which have been reitereated.

Notetaking is similar to underlining, but is more dependent upon a student's prior world knowledge and word knowledge. Students with a good deal of general information have a general outline as to what they need to write, and what may be skipped. Further, students with a good vocabulary are not thwarted and stumped by unfamiliar terms and constructs.

Views on learning have changed considerably over the past twenty years. The table below compares behavioral learning theory with traditional cognitive theory.

Behavioral Learning Theory	Traditional Cognitive Theory
1. Learner is seen as passive and reactive to environment.	1. Learner is seen as active and mastering the environment.
2. Learning occurs because of associations among stimuli or between stimuli and responses.	2. Learning occurs because the learner actively tries to understand the environment.
3. Knowledge consists of whatever pattern of associations have been learned.	3. Knowledge consists of an organized set of mental structures and procedures.
4. Learning is the acquisition of in new associations.	4. Learning consists of changes mental structure brought about by mental reasoning.
5. Prior knowledge influences new using learning primarily through indirect processes such as positive or negative transfer because of similarity of stimuli between situations.	5. New learning is based on prior knowledge to understand new situations and changing prior knowledge structures to deal with new situations.
6. Discussion of the activities of the mind is not permitted.	6. Discussion of activities of the mind is the central issue in psychology.

7. Strong experimental research tradition. Theories can only be verified through experiment.	7. Weak experimental research tradition. Observational research, thought experiments and logical analysis can be used.
8. Education consists of arranging stimuli so that desired associations are made.	8. Education consists of allowing/encouraging active mental exploration of complex environments.

(Andre & Phye, 1986, p. 2)

As can be seen, learning has now taken a different direction. It is being seen as more complex, dependent upon a host of factors and variables.

Hudgins, Phye, Schau, Theisen, Ames & Ames (1983) have formed a hierarchy of cognitive tasks, skills and processes relative to learning. This list includes:

Cognitive academic tasks.

- Language development
- Reading
- Mathematics
- Writing

Cognitive skills

Think skills (inductive and deductive reasoning)

Comprehension skills

Attention skills

Remembering skills

Study skills

Transfer skills

Inferential skills

Problem-solving skills

Critical thinking skills

Creative thinking skills

Cognitive processes

Attention

Short-term memory

Working memory

Long-term memory

Meta cognition

However, how much, and in what depth have the aforementioned processes been investigated? Snowman (1986) has reviewed the current status of research on learning tactics and strategies. The first group included underlining, summarizing, mnemonic devices, questioning, note taking and text analysis. The second group encompases "metacognitive knowledge with strategic and tactical skills." (p. 247)

Snowman's review of the research seems to highlight some critical issues regarding teaching strategies and tactics. The domains reviewed

were: a) underlining b) summarizing c) mnemonic devices (acronyms, sentences, narrative stories, peg words, method of loci and key word mnemonics. In the learning tactics strand, questioning, note-taking, text analysis (training in the use of text-structure analysis and in the use of headings and topic sentences) were examined.

What does the research tell us about teaching students how to learn? Overall, there are no clearcut answers as of yet. "Strongly affirmative to uncertain to doubtful" (p. 268) is the way Snowman describes the field. The research can always be criticized, and of course more needs to be done. However, there are a few over-riding themes which need to be addressed regarding those of strategies/tactics to help students learn.

First, in terms of curriculum, there should be a concerted effort from kindergarten to twelfth grade to a) teach students memory aids and to b) assist in their utilization in the real world.

Secondly, more specificity in research and in teaching is needed. To use "highlighting, underlining and summarizing" as strategies and tactics in a number of reading areas tells us little about specific subject domains i.e. math, science, etc.

Thirdly, more research should be conducted not in the lab, but in the classroom situation or setting. There are many reasons for this but suffice it to say that conditions in the lab and in the classroom are highly dissimilar.

Lastly, generalization and transfer of training issues are extremely important domains heretofore unaddressed.

With the increasing emphasis on learning in our highly technical computerized society. We must move much further in the facilitation of learning than we have in the past. Learning strategies/tactics are one vehicle for that movement.

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